# FAMILY TERAPONTIDAE IN GIANH ESTUARY AND GIANH DOWNSTREAM FROM VIETNAM 

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Analysis and identification of 42 specimens of family Terapontidae collected from Gianh estuary and Gianh downstream in Quang Binh province in north center region Vietnam. We have classified four species: Terapon jarbua (Forsskål, 1775); Helotes sexlineatus (Quoy \& Gaimard, 1825); Rhyncopelates oxyrhynchus (Temminck and Schlegel, 1842); Pelates quadrilineatus (Bloch, 1790). Species Rhyncopelates oxyrhynchus (Temminck and Schlegel, 1842) was first discovered in Gianh estuary and Gianh downstream in Quang Binh province in north center region Vietnam.

Keywords: Terapon jarbua, Helotes sexlineatus, Rhyncopelates oxyrhynchus, Pelates quadrilineatus, Terapontidae, Classification, Vietnam, Gianh river, Quang Binh.

## FAMILIA TERAPONTIDAE ÎN ESTUARUL GIANH ŞI ALBIA GIANH DIN VIETNAM

Au fost analizate şi identificate 42 de exemplare ale familiei Terapontidae colectate din estuarul Gianh şi din josul apei fluviului Gianh în provincia Quang Binh din regiunea centrală de nord a Vietnamului. Noi am clasificat 4 specii: Terapon jarbua (Forsskål, 1775); Helotes sexlineatus (Quoy \& Gaimard, 1825); Rhyncopelates oxyrhynchus (Temminck and Schlegel, 1842) şi Pelates quadrilineatus (Bloch, 1790). Speciile Rhyncopelates oxyrhynchus (Temminck and Schlegel, 1842) au fost descoperite pentru prima dată în estuarul Gianh şi în josul apei fluviului Gianh în provincia Quang Binh din regiunea centrală de nord a Vietnamului.

Cuvinte-cheie: Terapon jarbua, Helotes sexlineatus, Rhyncopelates oxyrhynchus, Pelates quadrilineatus, Terapontidae, clasificare, Vietnam, râul Gianh, Quang Binh.

## Introduction

Terapontidae is body of small to medium-sized perch-like fishes; body oblong to oblongovate, slightly to moderately compressed laterally. Mouth moderate, protractile, with gape often oblique, sometimes horizontal, jaws typically equal, sometimes upper jaw longer, the upper jaw not extending beyond centre of orbit, jaw teeth usually in villiform bands, with teeth of outer row distinctly larger than those in remainder of band, shape of jaw teeth conical, flattened, or tricuspidate; teeth also present on roof of mouth in juveniles of many species, lacking in adults of most species. Posterior and ventral margins of preopercle variably serrate, serrations more prominent in juveniles, usually more developed on vertical margin; first infraorbital with serrations along ventral margin, serrations less developed with age in some species: opercle with 2 spines posteriorly, the lower one larger and stronger, extending beyond margin of opercular lobe in some species. Posttemporal bone exposed and expanded posteriorly in some species with posterior margin serrate. Dorsal fin single, arched, with XI to XII spines and $8 \frac{1}{2}$ to $9 \frac{1}{2}$ soft rays, fourth to seventh dorsal-fin spines longest, those following decreasing in length to penultimate spine which is much shorter than ultimate spine in some species, this resulting in a notched spinous dorsal fin, anal fin with III variably strong spines and $7 \frac{1}{2}$ to 9 soft rays, pelvic-fin base located behind vertical line through base of pectoral fins, caudal fin usually emarginate. Lateral line single and complete. Scales adherent, finely ctenoid. Colour: body tan or light grey, often silvery in life with various dark markings; most marine species with 3 or more dark, straight or downwardly curved longitudinal stripes on body, many marine species with dark transverse bands on lobes of caudal fin [7]. During the time to research on fish in the Gianh river basin in the North Central part of Vietnam. We have already collected 42 specimens of Terapontidae. This study we classify and analyse this specimens.

## 1. Methods

Fish specimens were collected mainly from fishing men from Gianh estuary and Gianh downstream in Quang Binh province in north center region Vietnam. Fishing tools are fishnets, rackets, casting - net, multi size fishing - rods and also professional tools of fish men such as: fishing basket, fishing traps, etc. Specimens were fixed either in $10 \%$ formaldehyde and later transferred into $4 \%$ formaldehyde for storage or fixed and stored in $90 \%$ ethanol. All measurements and counts follow Walter J. Rainboth (1996) see Figure 1 [4].



Fig.1. Measurements taken on Terapontidae by Walter J. Rainboth.
We use the following materials to Identification species: Rainboth J. Walter (1996); Vari R. P (2001); Tetsji Nakabo (2002); Nguyen Van Hao (2005); Tran Dac Dinh et al. (2013). [2-6].

## Results and discussion

## 1. Pelates quadrilineatus (Bloch, 1790)

Synonyms. Holocentrus quadrilineatus Bloch, 1790; Therapon quadrilineatus (Bloch, 1790); Pristipoma sexlineatum Quoy \& Gaimard, 1824.

Material examined. (14 specimens) GRT 001 to GRT - 014, Gianh estuary and Gianh downstream, Quang Binh province, 10-15 August 2008, 20-27 December 2009 and 6 Oct. 2010.

Meristics. Dorsal $1=$ XII; Dorsal $2=9$; Anal = III. 8.5; Pectoral = 13; Pelvic = I. 5; Caudal = 3.15.3; Opercle spine $=2$; Preopercle spine $=35-40$; Lateral line $=69-71$; Rows of scales above lateral line $=12-13$; Rows of scales below lateral line $=21-22$; Lacrimal spines (Preorbital edge) $=13-19$; Rows of scales on cheek $=5$.

## Morphometric

Standard length $=0.82(0.79-0.96)$ Total length $=0.84(0.84-0.86)$ Fork length $=3.27(3.09-3.36)$ Head length $=7.77(7.17-8.68)$ Postorbital $=2.55(2.50-2.59)$ Predorsal 1 length $=1.44(1.40-1.48)$ Predorsal 2 length $=1.55(1.51-1.59)$ Preanal length $=1.67(1.61-1.73)$ Pre-anus length $=3.30(3.18-3.42)$ Pre-pelvic length $=2.91$ (2.77-3.10) Length of base dorsal 1 fin $=12.13$ (7.30-18.00) Length of base dorsal 2 fin $=4.42(4.07-4.57)$ Length of base anal fin $=10.63(9.96-11.48)$ Eye diameter $=13.05(12.23-13.98)$ Interorbital width $=9.22(8.68-9.59)$ Snout length $=6.35(6.11-6.65)$ Length of caudal peduncle $=10.14$ (9.63-10.44) Depth of caudal peduncle $=3.05$ (2.94-3.16) Depth of body $=5.73(5.08-6.43)$ Length of dorsal $1=6.46(5.74-7.80)$ Length of dorsal $2=6.78(5.89-8.03)$ Length of anal $=5.09(4.69-6.03)$ Length of pectoral $=4.50(4.34-4.89)$ Length of pelvic $=3.74(2.49-4.63)$ Length of upper caudal lobe $=3.95$ (2.62-4.61) Length of lower caudal lobe $=4.78$ (3.07-5.78) Length of median caudal rays.

Head length $=0.89(0.83-0.95)$ Length of base dorsal 1 fin $=1.61(1.41-2.01)$ Length of base dorsal 2 fin $=1.35(1.22-1.42)$ Length of base anal fin $=2.37(2.20-2.60)$ Postorbital $=3.25(3.00-3.52)$ Eye diameter $=3.99(3.68-4.53)$ Interorbital width $=2.82(2.69-2.89)$ Snout length $=1.94(1.83-2.15)$ Length of caudal peduncle $=3.10(2.91-3.38)$ Depth of caudal peduncle $=0.93(0.88-1.00)$ Depth of body.

Length of caudal peduncle $=1.60(1.53-1.70)$ Depth of caudal peduncle; Eye diameter $=1.23$ (1.081.36) Interorbital width; Length of base dorsal 1 fin $=1.82$ (1.56-2.36) Length of base dorsal 2 fin $=1.52$ (1.41-1.61) Length of base anal fin.


Fig.2. Pelates quadrilineatus (Bloch, 1790).

## Diagnostic characters. (Figure 2)

A moderately small species; body oblong, compressed laterally. Jaws equal, gape oblique: posterior margin of upper jaw extending to vertical line through posterior nostril; teeth browntipped, 2 rows in lower jaw and 3 rows or a villiform band with outer row of upper jaw enlarged in upper jaw; vomer and palatines toothless. Preopercle serrate, serrations larger along vertical border, particularly in adults; lower opercular spine stronger and longer, but not extending beyond margin of opercular lobe. Posttemporal bone not expanded or exposed posteriorly, covered with skin and scales. First gill arch with 16 to 18 gill rakers on upper limb, 22 to 27 on lower limb. Dorsal fin with spinous part of fin arched, fifth to seventh spines longest, and last 2 spines of approximately same length; second anal-fin spine subequal to third spine and shorter than longest anal-fin rays.

Colour: dorsal portions of body silvery grey, ventral part of body silvery white; 4 to 6 narrow, dark brown or black horizontal stripes on body, the middle stripe extending onto caudal-fin base; juveniles in addition have 6 or 7 greyish vertical bars; spinous portion of dorsal fin with a black blotch dorsally on membranes between third to seventh dorsal-fin spines; a blotch of variable intensity on side of body posterior to nape; lobes of caudal fin without prominent transverse black stripes; mouth and gill cavity red in life [7].

## 2. Helotes sexlineatus (Quoy \& Gaimard, 1825)

Synonyms: Terapon sexlineatus Quoy \& Gaimard, 1825; Pelates sexlineatus (Quoy \& Gaimard, 1825); Pelates quinquelineatus Cuvier, 1829

Material examined. ( 14 specimens) GRT 015 to GRT - 027, Gianh estuary and Gianh downstream, Quang Binh province, 10-15 August 2008, 20-27 December 2009 and 6 October 2010.


Fig.3. Helotes sexlineatus (Quoy \& Gaimard, 1825).
Meristics. Dorsal $1=$ XI; Dorsal $2=9.5$; Anal = III.9; Pectoral = 13; Pelvic = I.5; Caudal = 4.16.4; Opercle spine $=2$; Preopercle spine $=30-33$; Lateral line $=80-83$; Rows of scales above lateral line $=12$; Rows of scales below lateral line $=24$; Lacrimal spines $($ Preorbital edge $)=15-20$; Rows of scales on cheek $=5$.

## Morphometric

Standard length $=0.81(0.80-0.82)$ Total length $=0.84(0.82-0.85)$ Fork length $=3.22(3.05-3.41)$
Head length $=7.76(7.16-8.14)$ Postorbital $=2.66(2.51-2.76)$ Predorsal 1 length $=1.45(1.40-1.51)$ Predorsal 2 length $=1.54(1.49-1.59)$ Preanal length $=1.64(1.55-1.68)$ Pre-anus length $=3.16(2.89-3.35)$ Pre-pelvic length $=2.98$ (2.85-3.11) Length of base dorsal 1 fin $=13.21$ (9.10-18.00) Length of base dorsal 2 fin $=4.48(4.17-4.99)$ Length of base anal fin $=10.85(10.46-11.41)$ Eye diameter $=13.10(12.26-14.69)$ Interorbital width $=9.02(8.40-10.10)$ Snout length $=6.51(5.94-7.22)$ Length of caudal peduncle $=10.19$ ( $9.51-11.24$ ) Depth of caudal peduncle $=3.15(3.03-3.32)$ Depth of body $=6.03(5.27-7.36)$ Length of dorsal $1=6.57(5.39-7.20)$ Length of dorsal $2=6.66(5.89-7.75)$ Length of anal $=5.23(4.97-5.76)$ Length of pectoral $=4.47$ (4.32-4.60) Length of pelvic $=4.16$ (3.95-4.30) Length of upper caudal lobe $=4.45$ (4.37-4.60) Length of lower caudal lobe $=5.33$ (5.05-5.66) Length of median caudal rays.

Head length $=0.93(0.87-0.99)$ Length of base dorsal 1 fin $=1.56(1.32-1.81)$ Length of base dorsal 2 fin $=1.40(1.23-1.63)$ Length of base anal fin $=2.41(2.15-2.60)$ Postorbital $=3.38(3.14-3.50)$ Eye diameter $=4.08(3.65-4.58)$ Interorbital width $=2.80(2.62-2.97)$ Snout length $=2.03(1.78-2.22)$ Length of caudal peduncle $=3.17(2.97-3.50)$ Depth of caudal peduncle $=0.98(0.91-1.03)$ Depth of body.

Length of caudal peduncle $=1.57$ (1.40-1.76) Depth of caudal peduncle; Eye diameter $=1.21(1.09-$ 1.35) Interorbital width; Length of base dorsal 1 fin $=1.68$ (1.49-1.99) Length of base dorsal 2 fin $=1.50$ (1.37-1.65) Length of base anal fin.

Diagnostic characters. (Figure 3)
A small species, body oblong, slightly compressed laterally. Jaws equal, gape short and oblique; posterior margin of upper jaw extending to vertical line midway between vertical through posterior nostril and anterior margin of eye; teeth tricuspidate, cusps of nearly equal size, teeth in bands in each jaw, outer row of teeth enlarged; vomer and palatines toothless. Preopercle serrate, serrations larger along vertical border; lower opercular spine stronger and longer, extending nearly to, but not surpassing, margin of opercular lobe in adults. Posttemporal bone not expanded or exposed posteriorly, covered with skin and scales. First gill arch with 6 or 7 rakers on upper limb, 14 or 15 on lower limb. Dorsal fin with spinous part of fin arched, fifth or sixth spines longest, and penultimate spine shorter than ultimate spine; second anal-fin spine subequal to third spine and much shorter than longest anal-fin rays.

Colour: dorsal portion of body greyish or bluish, ventral part of body silvery to silvery white; 5 to 8 narrow, dark brown or black horizontal stripes on body, the midlateral stripe extending onto caudal-fin base; spinous part of dorsal fin with black margin dorsally on membranes; a blotch of variable intensity on side of body posterior to nape; caudal fin with dark border and several bands of faint spots basally, but without prominent transverse black stripes [7].

## 3. Rhyncopelates oxyrhynchus (Temminck and Schlegel, 1842)

Synonyms: Therapon oxyrhynchus Temminck \& Schlegel, 1842; Pelates oxyrhynchus (Temminck \& Schlegel, 1842).

Material examined. ( 14 specimens) GRT 028 to GRT - 033, Gianh estuary, Quang Binh province, 10-15 August 2008, 20-27 December 2009 and 6 October 2010.

Meristics. Dorsal $1=$ XII; Dorsal $2=8.5$; Anal $=$ III.7; Pectoral $=14$; Pelvic $=$ I.5; Caudal $=3.17 .3$; Opercle spine $=2$; Preopercle spine $=13-17$; Lateral line $=60-65$; Rows of scales above lateral line $=14$ 15; Rows of scales below lateral line $=23-25$; Lacrimal spines $($ Preorbital edge $)=6-9$; Rows of scales on cheek $=8-9$.

## Morphometric

Standard length $=0.83(0.81-0.89)$ Total length $=0.84(0.83-0.85)$ Fork length $=2.83(2.79-2.86)$ Head length $=6.43$ (6.28-6.60) Postorbital $=2.48(2.39-2.53)$ Predorsal 1 length $=1.36(1.31-1.39)$ Predorsal 2 length $=1.45(1.41-1.51)$ Preanal length $=1.58(1.53-1.64)$ Pre-anus length $=2.85(2.74-2.98)$ Pre-pelvic length $=2.57(2.76-2.95)$ Length of base dorsal 1 fin $=7.50(6.20-9.10)$ Length of base dorsal 2 fin $=5.16(4.95-5.48)$ Length of base anal fin $=10.11(9.86-10.58)$ Eye diameter $=14.17(13.54-15.00)$ Interorbital width $=8.01$ (7.66-8.53) Snout length $=6.50(6.11-7.00)$ Length of caudal peduncle $=8.35$ (8.16-8.68) Depth of caudal peduncle $=2.78(2.66-2.92)$ Depth of body $=5.12(5.01-5.22)$ Length of dorsal $1=6.31(5.89-6.78)$ Length of dorsal $2=5.41(4.99-5.73)$ Length of anal $=5.07(4.95-5.17)$ Length of pectoral $=4.12(4.08-4.20)$ Length of pelvic $=4.39(4.28-4.55)$ Length of upper caudal lobe $=4.60$ (4.18-4.89) Length of lower caudal lobe $=5.18(4.93-5.54)$ Length of median caudal rays.


Fig.4. Rhyncopelates oxyrhynchus (Temminck and Schlegel, 1842).

Head length $=0.97(0.90-1.06)$ Length of base dorsal $1 \mathrm{fin}=2.28(1.79-2.82)$ Length of base dorsal 2 fin $=1.82(1.77-1.97)$ Length of base anal fin $=2.27(2.20-2.31)$ Postorbital $=3.57(3.46-3.79)$ Eye diameter $=5.00(4.73-5.24)$ Interorbital width $=2.83(2.73-2.98)$ Snout length $=2.29(2.13-2.51)$ Length of caudal peduncle $=2.95(2.86-3.04)$ Depth of caudal peduncle $=0.98(0.95-1.03)$ Depth of body.

Length of caudal peduncle $=1.29(1.18-1.34)$ Depth of caudal peduncle; Eye diameter $=1.40$ (1.341.52) Interorbital width; Length of base dorsal $\mathbf{1} \mathbf{f i n}=2.37(1.69-3.15)$ Length of base dorsal 2 fin $=1.88$ (1.67-2.06) Length of base anal fin.

Diagnostic characters. (Figure 4)
A moderate-sized species; body oblong, moderately deep, compressed laterally, more so in juveniles. Jaws equal, gape slightly oblique; posterior margin of upper jaw extending to vertical line through posterior nostril. Teeth villiform, in bands in each jaw, outer row of teeth much enlarged; vomer and palatines toothless. Preopercle serrate, serrations larger along vertical border; lower opercular spine stronger and longer, not extending beyond margin of opercular lobe. Posttemporal bone expanded and exposed posteriorly, with serrate posterior margin. First gill arch with 7 or 8 gill rakers on upper limb, 14 to 16 on lower limb. Dorsal fin with spinous part of fin arched, third to sixth spines longest, and penultimate and ultimate spines subequal; second anal-fin spine longest and shorter than longest anal-fin rays.

Colour: dorsal portions of body grey, ventral part of body silvery to silvery white; 4 somewhat blotchy dark brown or black horizontal stripes on body; some individuals with irregular stripes between 2 dorsal and 2 ventral primary stripes; spinous part of dorsal fin dusky basally and distally; soft portion of dorsal fin with a basal band anteriorly and pigmentation across posterior rays. Spinous portion of anal fin unpigmented; caudal fin clear in juveniles, with several narrow, irregular, parallel stripes on each lobe in adults [7].

## 4. Terapon jarbua (Forsskål, 1775)

Synonyms: Terapon timorensis Quoy \& Gaimard, 1824; Sciaena jarbua Forsskål, 1775; Holocentrus servus Bloch, 1790; Coius trivittatus Hamilton, 1822; Pterapon trivittatus Gray, 1846; Therapon farna Bleeker, 1879; Stereolepis inoko Schmidt, 1931.

Material examined. ( 14 specimens) GRT 034 to GRT - 041, Gianh estuary and Gianh downstream, Quang Binh province, 10-15 August 2008, 20-27 December 2009 and 6 October 2010.

Meristics. Dorsal 1 = XII; Dorsal 2 = 9.5; Anal = III. 7.5; Pectoral = 14; Pelvic $=$ I.5; Caudal $=3.18 .3$; Opercle spine $=2$; Preopercle spine $=17-18 ;$ Lateral line $=95-107$; Rows of scales above lateral line $=14-15$; Rows of scales below lateral line $=29-34$; Lacrimal spines $($ Preorbital edge $)=10-12$; Rows of scales on cheek $=10-13$.

## Morphometric

Standard length $=0.79(0.77-0.81)$ Total length $=0.85(0.84-0.86)$ Fork length $=3.09(3.02-3.18)$ Head length $=6.46(6.32-6.62)$ Postorbital $=2.45(2.36-2.59)$ Predorsal 1 length $=1.43(1.39-1.49)$ Predorsal 2 length $=1.50(1.44-1.55)$ Preanal length $=1.61(1.54-1.67)$ Pre-anus length $=3.13(3.00-3.33)$ Pre-pelvic length $=3.02(2.78-3.15)$ Length of base dorsal 1 fin $=13.70(8.60-17.40)$ Length of base dorsal 2 fin $=5.22(4.72-5.57)$ Length of base anal fin $=10.90(10.12-11.83)$ Eye diameter $=11.06(10.05-11.75)$ Interorbital width $=9.54(8.55-10.27)$ Snout length $=5.83(5.37-6.31)$ Length of caudal peduncle $=8.48$ (8.16-8.95) Depth of caudal peduncle $=3.02(2.82-3.18)$ Depth of body $=5.16(4.60-5.91)$ Length of dorsal $1=6.18(5.15-7.09)$ Length of dorsal $2=6.13(5.45-7.51)$ Length of anal $=5.41(4.91-6.06)$ Length of pectoral $=4.31(3.96-4.64)$ Length of pelvic $=3.81(3.43-4.16)$ Length of upper caudal lobe $=3.99$ (3.63-4.40) Length of lower caudal lobe $=5.38(4.91-6.01)$ Length of median caudal rays.

Head length $=0.98(0.90-1.04)$ Length of base dorsal $1 \mathrm{fin}=1.64(1.47-1.84)$ Length of base dorsal 2 fin $=1.69(1.52-1.80)$ Length of base anal fin $=2.09(2.04-2.12)$ Postorbital $=3.52(3.23-3.83)$ Eye diameter $=3.58(3.16-3.89)$ Interorbital width $=3.08(2.78-3.28)$ Snout length $=1.88(1.74-2.02)$ Length of caudal peduncle $=2.74(2.57-2.96)$ Depth of caudal peduncle $=0.98(0.89-1.04)$ Depth of body.

Length of caudal peduncle $=1.46(1.30-1.60)$ Depth of caudal peduncle; Eye diameter $=1.02(0.94$ 1.10) Interorbital width; Length of base dorsal $\mathbf{1} \mathbf{f i n}=1.68$ (1.46-2.03) Length of base dorsal 2 fin $=1.73$ (1.55-1.91) Length of base anal fin.


Fig.5. Terapon jarbua (Forsskål, 1775).
Diagnostic characters. (Figure 5)
A moderate-sized species. Body oblong moderately compressed laterally. Jaws equal, gape oblique; rear end of upper jaw reaching to vertical through anterior margin of eye in juveniles, reaching to vertical through centre of orbit in adults; teeth conical, slightly recurved, in villiform bands, the outer row much enlarged; vomer and palatines with teeth in juveniles, often toothless in adults. Preopercle strongly serrate, particularly at angle; lower opercular spine very long and strong, extending distinctly beyond margin of opercular lobe. Posttemporal bone expanded, exposed and serrate posteriorly; cleithrum serrate posteriorly. First gill arch with 6 to 8 rakers on upper limb, 12 to 15 on lower limb. Dorsal fin with spinous part of fin strongly arched and deeply notched, fourth to sixth spines longest, and penultimate spine about $1 / 2$ length of ultimate spine; margin of soft part of dorsal fin straight or emarginate; second anal-fin spine subequal to third spine and shorter than longest anal-fin rays, margin of soft part of anal fin concave; caudal fin emarginate.

Colour: Body silvery greyish or dorsally and silvery white ventrally; 3 or 4 dark brown or black downwardly curved longitudinal stripes on body; spinous portion of dorsal fin with a blackish blotch dorsally on membranes between third and sixth spines; soft portion of dorsal fin with membranes of first 3 rays tipped with black and membranes between fifth and seventh rays entirely black; caudal fin with medial rays pigmented; both caudal-fin lobes with dark tips and a transverse band [7].

## Conclusion

Analysis and identification of 42 specimens of family Terapontidae collected from Gianh estuary and Gianh downstream in Quang Binh province in north center region Vietnam. We have classified four species: Terapon jarbua (Forsskål, 1775); Helotes sexlineatus (Quoy \& Gaimard, 1825); Rhyncopelates oxyrhynchus (Temminck and Schlegel, 1842); Pelates quadrilineatus (Bloch, 1790). Which has species: Rhyncopelates oxyrhynchus (Temminck and Schlegel, 1842); was first discovered in Gianh estuary and Gianh downstream in Quang Binh province in north center region Vietnam.

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